

AMENDMENTS TO THE CLAIMS

Claim 1 (currently amended): A method of controlling the crystalline structure of ingots and castings of ferrous and non-ferrous metals, in which a melt is crystallized in helically traveling magnetic fields excited by m-phase systems of alternating currents, the method comprising:

providing inductors positioned around a metal melt;

applying a train of said m-phase systems of alternating currents modulated in a superwave pattern to the inductors positioned around the melt to excite said modulated helically traveling magnetic fields in the melt, ~~a cluster of intensified energy pulses being superimposed on each m-phase system of alternating currents with a certain periodically repeated duration in time, wherein each pulse in the cluster of pulses has an amplitude that is proportional to an instantaneous amplitude of a major wave associated with the train of m-phase systems of alternating currents, and wherein each pulse in the cluster of pulses has a frequency that is proportional to an instantaneous a frequency of the major wave associated with the train of m-phase systems of alternating currents.~~

Claim 2 (previously presented): A method of controlling the crystalline structure according to claim 1, wherein said m-phase systems of alternating currents are periodically switched on for a certain time interval and switched off with a certain time interval.

Claim 3 (Previously presented): A method of controlling the crystalline structure according to claim 1 or 2, wherein amplitude and frequency of each pulse in the cluster of pulses are periodically changed in time.

Claim 4 (Previously presented): A method of controlling the crystalline structure according to claim 1 or 2, wherein amplitude and frequency of each pulse in the cluster of pulses are increased with increasing thickness of the crystallizing solid phase.

Claim 5-31 (Canceled)